

PRINTER:

RADIO SHACK® TRS-80 MODEL DMP-120



TECHNICAL SERVICE DATA FOR YOUR PRINTER

PRELIMINARY SERVICE CHECKS

This data provides the user with a time-saving service tool designed for quick isolation and repair of Printer malfunctions.

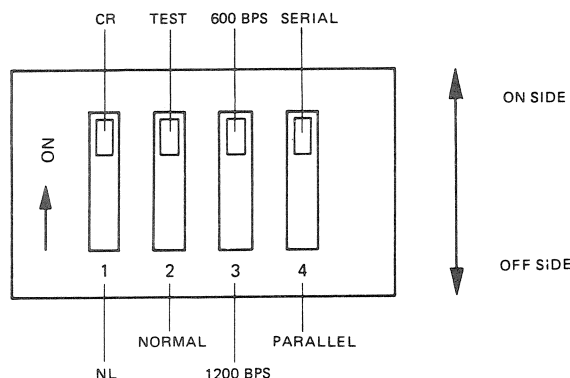
Check all interconnecting cables for good connection and correct hookup before making service checks.

GENERAL OPERATING INSTRUCTIONS

SETTING DIP SWITCHES

There are four switches located at the rear of the Printer. Setting these switches allows the Printer to work with different host Computers.

NOTE: The Printer AC power must be Off before setting any of the switches.



PRINT FUNCTION (DIP) SWITCHES

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SW NO.	SYMBOL	OFF	ON
1	NL/CR	Carriage return generates CR + LF (Line Feed) operation	Carriage return generates CR ONLY
2	NORMAL/TEST	Normal operation	Self-Test pattern
3	1200B/600B	1200 baud per second rate used serial interface	600 baud per second rate used serial interface
4	Parallel/Serial	Parallel Interface	Serial Interface

POWER UP

When the Printer is turned On, the RAM IC (IC13) is cleared by the CPU IC (IC11). The CPU IC then reads the function selection switch, drives the Carriage to the home position and waits to receive print data, Carriage, Line Feed and Lamp condition data. The print data sent from the Computer to the Printer is received by the CPU. After the printing start condition is fulfilled, the CPU moves the Carriage to print as the data directs. At completion the CPU stops the Carriage.

CARRIAGE MOVEMENT TEST

This test will check how freely the Carriage moves from one end of the Platen to the other and that the Platen advances properly. During this test there is no printing.

Place On-Line/Off-Line Switch (SW101) in On-Line position and turn Printer On. The Carriage will move right and left and execute a line feed at the end of each line. Turn Printer Off to stop Carriage Movement Test.

SELF-TEST

Before starting the Self-Test, check Print Head (M23) for proper adjustment (See Mechanical Adjustments-Print Head) and that paper is in the Printer and feeding correctly. The test will last for several minutes and sample the different font styles, print widths and intensities, and some dot graphics.

Set Print Function Switch (SW1-2) to On and the On-Line/Off-Line Switch (SW101) to Off-Line position. Turn the Printer On. The Printer will proceed to print all the characters that it can print and will continue until the Printer is turned Off.

PAPER EMPTY WARNING

If the Printer stops during printing because it is out of paper, the ALERT lamp will light and the Printer will automatically go Off-Line. To continued printing, insert more paper and move the On-Line/Off-Line Switch (SW101) to Off-Line position then back to On-Line position again. The Printer will continue without losing data in the print buffer. The ALERT lamp will also light if there is a Carriage fault. NOTE: Turning the Printer Off to make paper change/addition, or Off and On during operation may cause loss of the current program.

SAMS™

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The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed.

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PRELIMINARY SERVICE CHECKS (Continued)

SERVICE CHECKS

SEE INTERCONNECTING DIAGRAM, PLACEMENT CHART, AND PHOTOS TO MATCH THE NUMBER IN THE CIRCLES WITH THOSE IN THE FOLLOWING DATA FOR SERVICE CHECKS TO BE PERFORMED.

① PRINTER DEAD

- (A) Check AC Fuse (F301) and if open, replace.
- (B) See if the Alert Indicator (RED, D102) is lit while the Power Indicator (Green, D101) is Off.
- (C) If Alert Indicator D102 is Off, check the Power Cord, the Power Switch (SW301), and Power Transformer (AT301).
- (D) If Alert Indicator D102 is On, see if the Printer is out of paper.
- (E) Check DC Fuses (F1 and F2).
- (F) If Fuse F1 or F2 is open, check Rectifier Diode (RE1) and Regulator IC (PIC1).
- (G) If Diode RE1 and IC PIC1 are good, replace Master Board.
- (H) Check DC Fuse (F3). If Fuse F3 is open, check Rectifier Diode (RE2) and Resistors R1A and R2A.

② PRINTER NOT RECEIVING DATA FROM HOST COMPUTER

- (A) Check Connector CN9 and ribbon cable to the Host Computer.
- (B) Check the setting of Print Function Switch (SW1).
- (C) Check the CPU IC (IC11) by substituting Master Board.

③ PRINT HEAD WILL NOT PRINT

- (A) Remove power and check resistance of the solenoids of Print Head (M23). Measure the resistances between pin 7 and pins 1 thru 5, 9, 10, 11 and 12 of Connector CN8. The measurement should be approximately 18 ohms.
- (B) If the Print Head (M23) is good, check for 23.9V at pin 7 or 8 of Connector CN8 and also check Connector CN8 for a good connection.
- (C) If the 23.9V is present and Connector CN8 is good, check the Master Board by substitution.
- (D) See if the Print Head will print in self-test mode. If Print Head operates normally in self-test mode, check Connector CN9 and cable to Host Computer.

④ PRINT HEAD HAS MISSING DOTS

- (A) Check the Print Head solenoids at Connector CN8 for a resistance of 18 ohms. If all solenoids measure the correct resistance, remove the Print Head and check the head pins for possible damage. If Print Head pins are damaged, replace Print Head assembly.
- (B) If the Print Head checks good, check the Master Board by substitution.

⑤ CARRIAGE MOTOR/PAPER FEED MOTOR DOES NOT FUNCTION

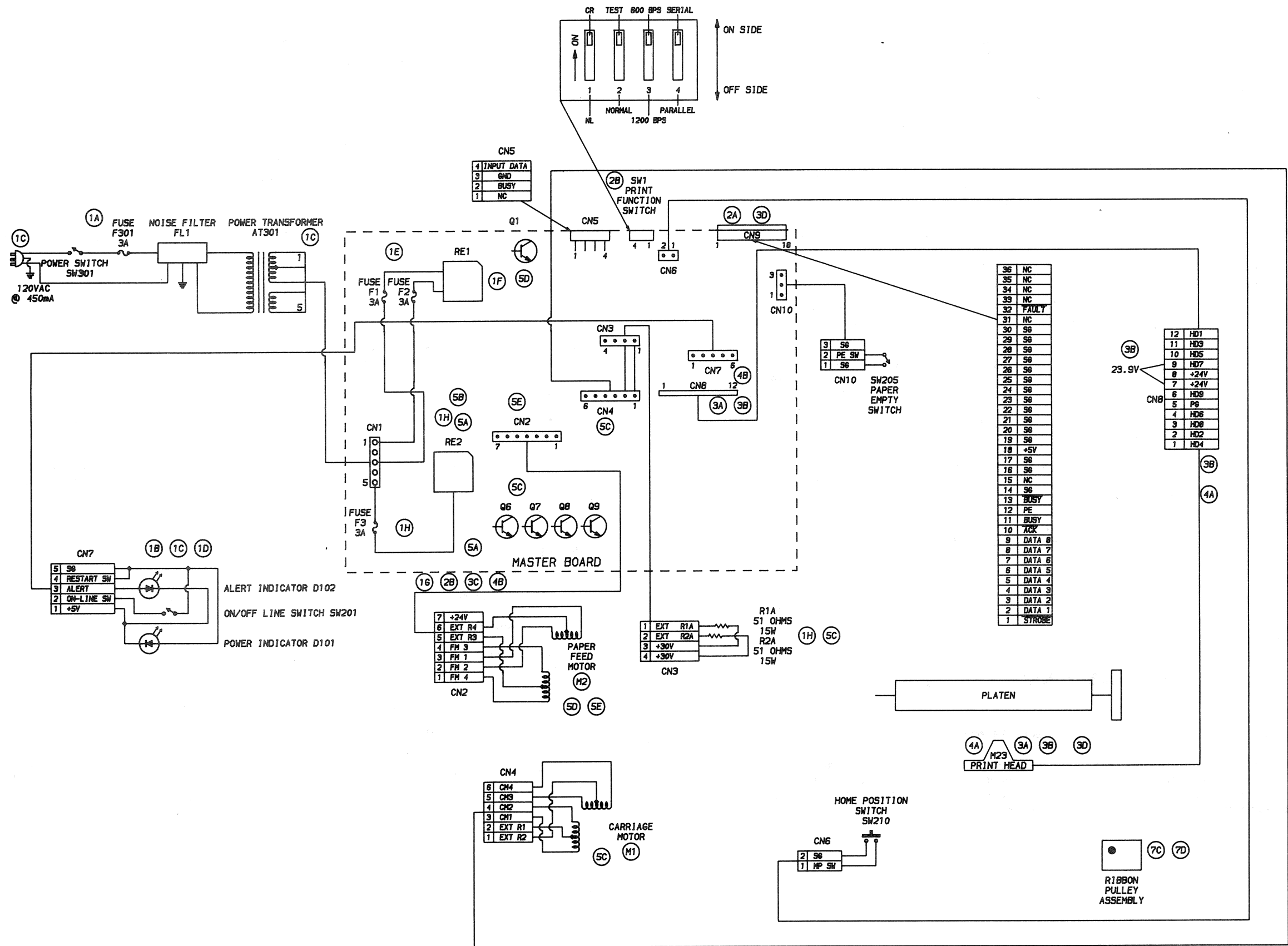
- (A) Check for 33V at the cathode of Rectifier Diode (RE2). If the 33V is missing, check DC Fuse (F3).
- (B) If Fuse F3 is open, check Diode RE2.
- (C) If Diode RE2 is open, check Resistors R1A and R2A. If resistors are defective, check Carriage Motor (M1) by substitution. Also, check Output Transistors (Q6 thru Q9) and Connector CN4.
- (D) If the Paper Feed Motor (M2) will not run, check for 23.9V at the emitter of Regulator Transistor (Q1). If the voltage is missing, check Transistor Q1 by substitution.
- (E) If Transistor Q1 is bad, check the Paper Feed Motor (M2) by substitution. Also check Connector CN2.

⑥ NOISY MECHANISM WHEN PRINTER TURNED ON

- (A) Remove power and check inside Printer for foreign objects such as paper clips or anything dropped inside the Printer.
- (B) Check for loose mechanism. Check the carriage wire which drives the carriage assembly. If the wire is loose, check for a loose or broken pulley or broken carriage wire.
- (C) Check for dirty carriage shafts. Check for free carriage movement on the shafts.

⑦ LIGHT PRINTING

- (A) See if adjusting the Print Head Adjustment Lever causes the print to darken.
- (B) See if the Print Head (M23) is clogged with dirt or other foreign objects.
- (C) See if the ribbon is old worn and also if the ribbon pulley is turning. Check the pulley by moving the carriage assembly back and forth.
- (D) See if the ribbon cassette roller is properly fitted onto the ribbon pulley.



PRELIMINARY SERVICE CHECKS (Continued)

TEST EQUIPMENT AND TOOLS

REPLACEMENT PARTS

TEST EQUIPMENT

Digital Volt/Ohm Meter
Frequency Counter
Logic Probe

TOOLS

Phillips Screwdriver
Low Voltage Soldering Iron
Desoldering Tool

ITEM	PART NO.	DESCRIPTION
AT301	HG82B025401	Power Transformer
D101	24440400124	LED, (Green) Power Indicator
D102	24440400106	LED, (Red) Alert Indicator
F1	24247000008	Fuse, 3A @ 125VAC, Fast Acting
F2	24247000008	Fuse, 3A @ 125VAC, Fast Acting
F3	24247000008	Fuse, 3A @ 125VAC, Fast Acting
F301	24240000069	Fuse, 3A @ 250VAC, Fast Acting
IC11	2420NPEP159	IC, CPU TEC EP-159
M1	HG82B013501	Carriage Motor (M73)
M2	HG82B014001	Paper Feed Motor (M72)
M23	HG82C001201	Print Head Assembly
M38	HG03B007100	Carriage Shaft, Rear
M39	HG03B007200	Carriage Shaft, Front
M45	HG04B011310	Print Head Adjustment Lever (Gap Cam, Left)
M64	HG08B00530B	Carriage Wire, Long
M112	HG08B00530A	Carriage Wire, Short
PIC1	2420T78005P	IC, Regulator TA78005AP
Q1	2422TD71700	Transistor, Regulator 2SD717
Q6		Transistor, Output 2SD1376 or
thru	2422TD14380	2SD1438
Q9		
R1A	HG82B012411	Resistor, 51 ohms, 5%, 15W
R2A	HG82B012411	Resistor, 51 ohms, 5%, 15W
RE1		Diode, Rectifier 2B3•L
	2421T2B4B41	Diode, Rectifier 2B4B41
RE2	2421T5B4B41	Diode, Rectifier, 15B4B41
SW1	24453011101	Switch, Print Function (DIP)
15	HG82B014201	Ribbon Clutch Assembly

DISASSEMBLY INSTRUCTIONS

UPPER CABINET REMOVAL

Remove four screws (two each side) from cabinet bottom. Remove paper feed knob. Carefully lift cabinet top up and disconnect Connector CN7 and ground connector from Master Board. Remove cabinet top from Printer.

MASTER BOARD REMOVAL

Remove three screws from rear of Master board. Disconnect Print Head Connector (CN8). Carefully pull Master Board out from rear of Printer. Disconnect all connectors from Master Board to remove board from unit.

PRELIMINARY SERVICE CHECKS (Continued)

PREVENTATIVE MAINTENANCE

ENVIRONMENT

Computers perform best in a clean, cool area that is below 80 degrees Fahrenheit and free of dust and smoke particles. Even though home Computers are not affected by cigarette smoke as much as commercial Computers are affected, it is better to maintain a smoke-free area around the Computer. Do not block cabinet vents of any of the Computer system; Computer, Monitor, Printer, or other power devices.

ELECTRICAL POWER

Variations in the line voltage can affect the Computer. Try to avoid these fluctuations by using an AC receptacle that is on a power line not used by appliances or other heavy current demand devices. A power-surge protector, power-line conditioner, or non-interruptible power supply may be needed to cure the problem. **Do not** switch power On and Off frequently.

KEYBOARD

Liquids spilled into the Keyboard can ruin it. Immediately after a spill occurs, disconnect the Computer power plug from AC power outlet. Then, if circuitry or contacts are contaminated, disassemble the Keyboard and carefully rinse the Keyboard printed circuit board with distilled water and let it dry. Use a cotton swab to clean between the keys. Use a non-abrasive contact cleaner and lint-free wipers on accessible connectors and contacts.

DISK DRIVES

Clean the read/write heads of the Disk Drives about once a month or after 100 hours usage. Use only an approved head cleaning kit.

Handle carefully to preserve proper disk head alignment. A sudden bump or jolt to the Disk Drives can knock the disk head out of alignment. If the disk drive must be transported, place an old disk in slot and close door during transport.

Store disks in their protective covers and never touch the disk surface. Observe the disk handling precautions usually found on the back of disk protective covers.

PRINTERS

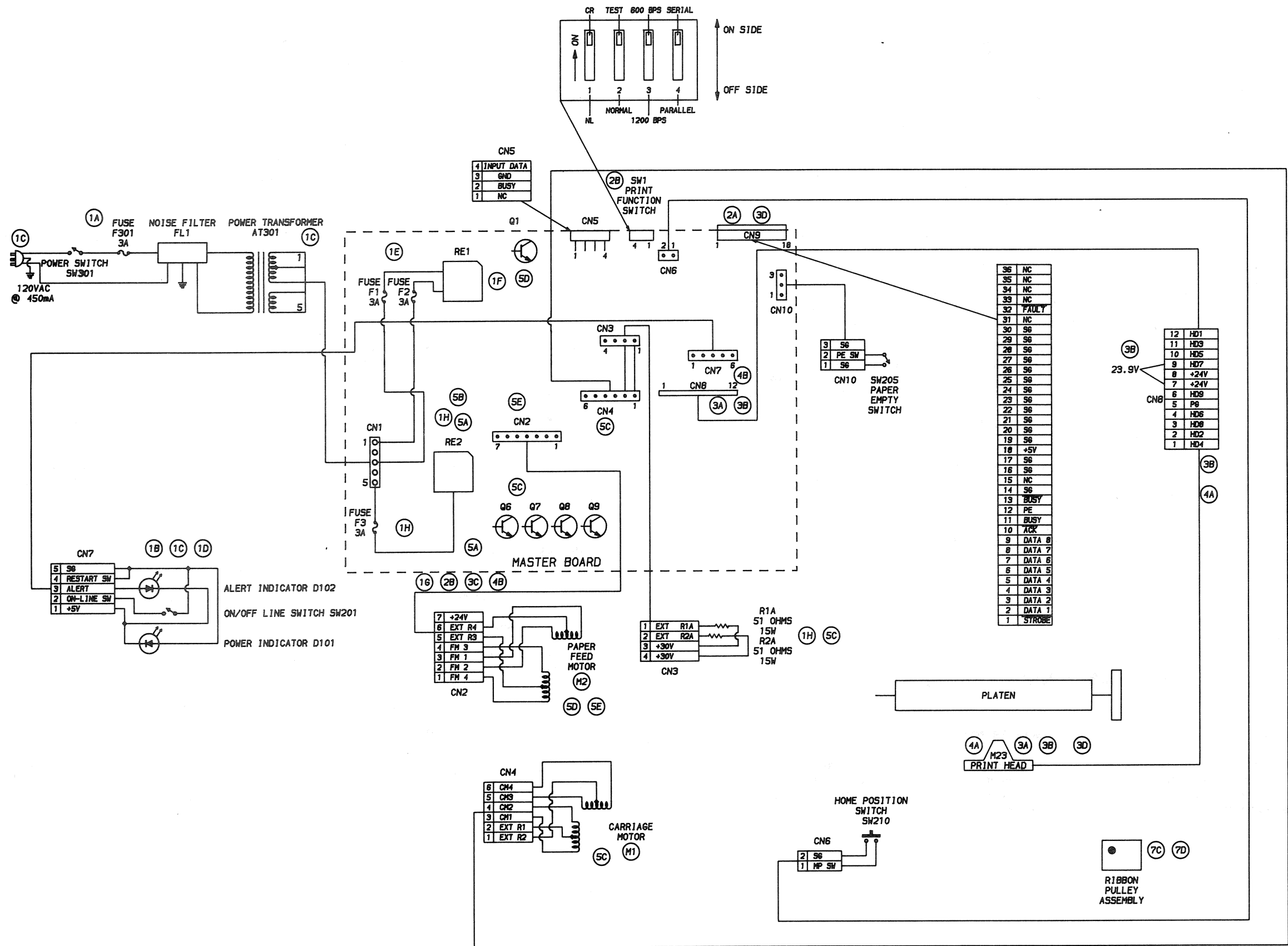
Carefully vacuum the Printer regularly. Wipe surface areas clean using a light all-purpose cleaner. Do not oil the machine. The oil will collect abrasive grit and dust. The dust will act as a blanket. This can cause components to overheat and fail.

STATIC ELECTRICITY

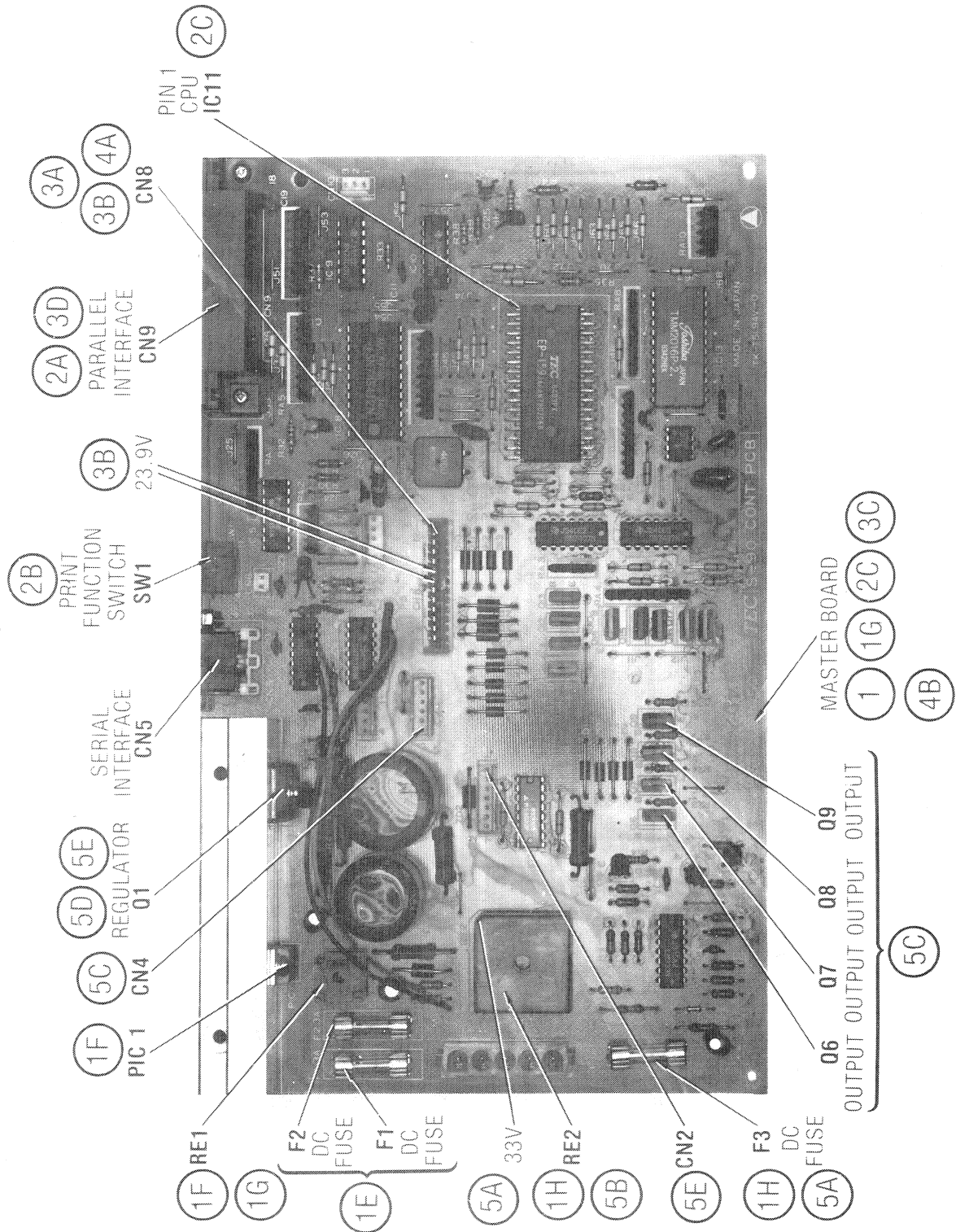
Static electricity discharge can affect the Computer. In order to minimize the possibility, use anti-static mats, sprays, tools and materials, and maintain good humidity in the Computer environment.

MONITOR

Use an isolation transformer with any Monitor that does not come as part of the system since some Monitors use a HOT chassis (chassis connected to one side of the AC line). The face of the Monitor should never be left on for long periods of time at high brightness level except when pattern is being changed periodically. Use caution when cleaning anti-glare screens, to preserve the glare-reduction feature.

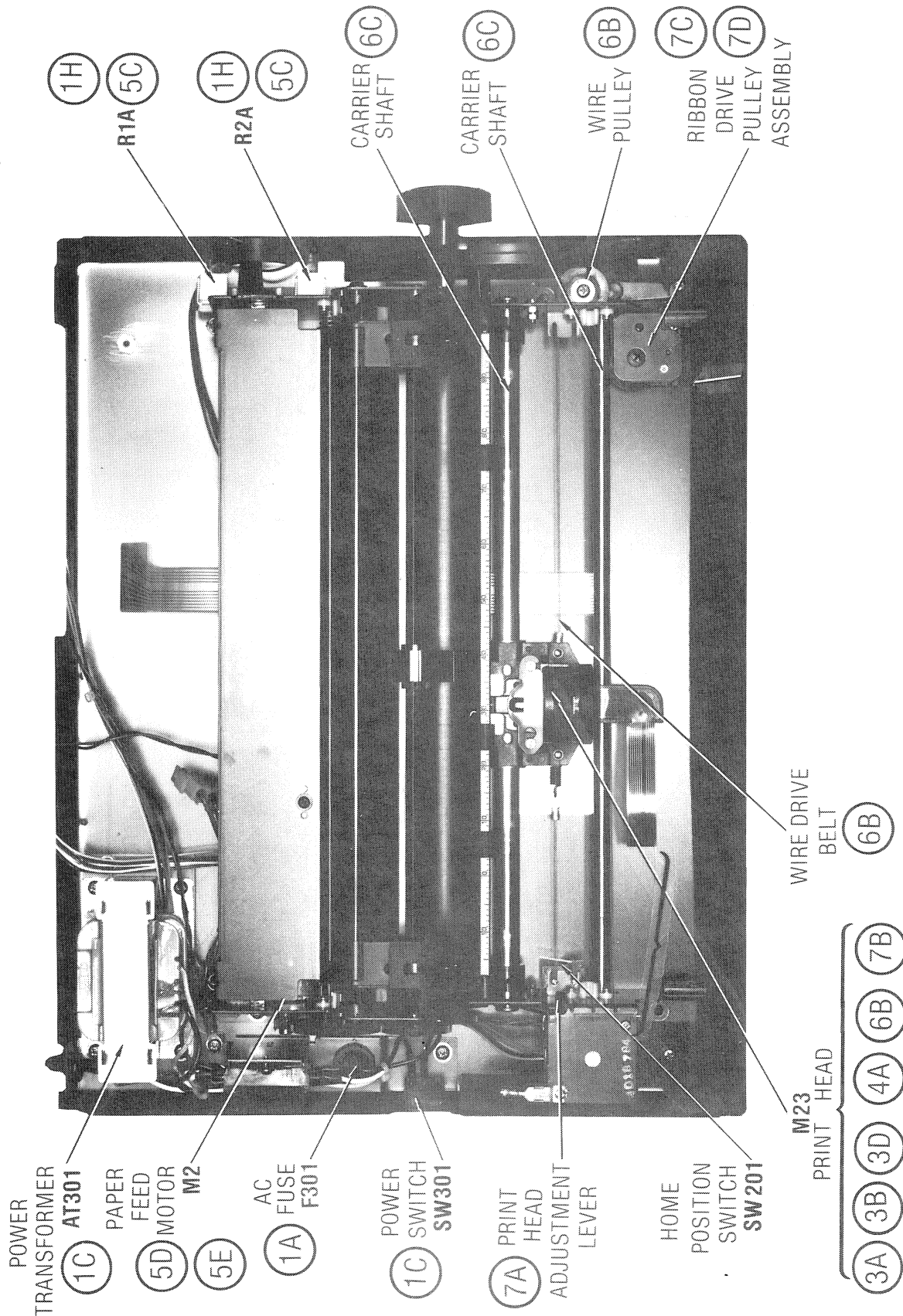


PRELIMINARY SERVICE CHECKS (Continued)



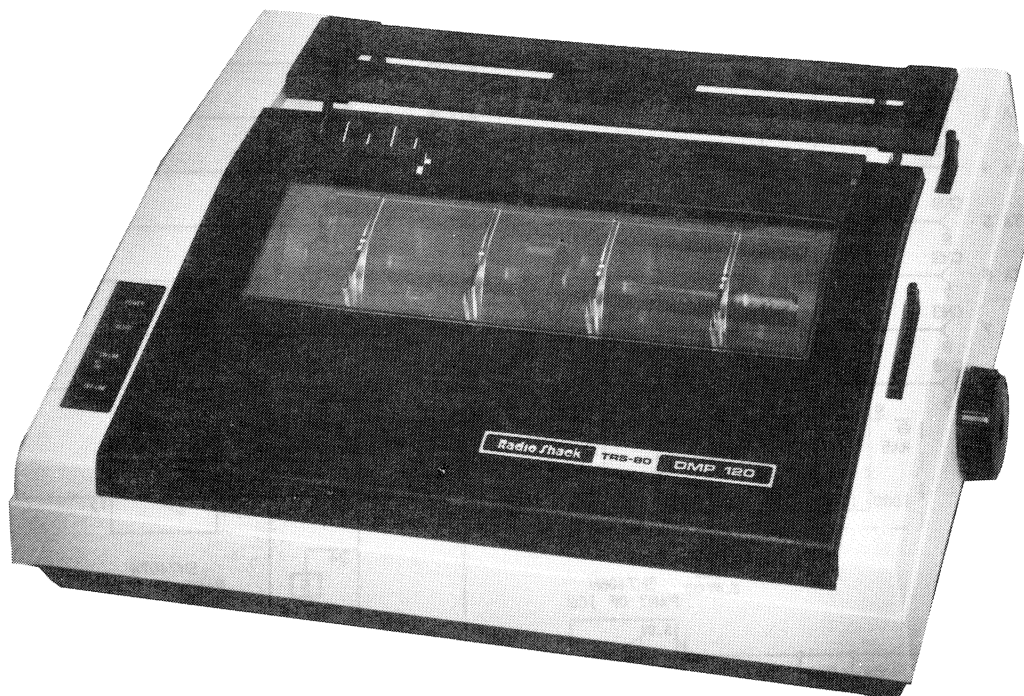
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MODEL DMP-120**

PRELIMINARY SERVICE CHECKS (Continued)



CHASSIS-TOP VIEW

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CP6



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CP6

MODEL DMP-120

PRELIMINARY SERVICE CHECKS
ENCLOSED

SAFETY PRECAUTIONS
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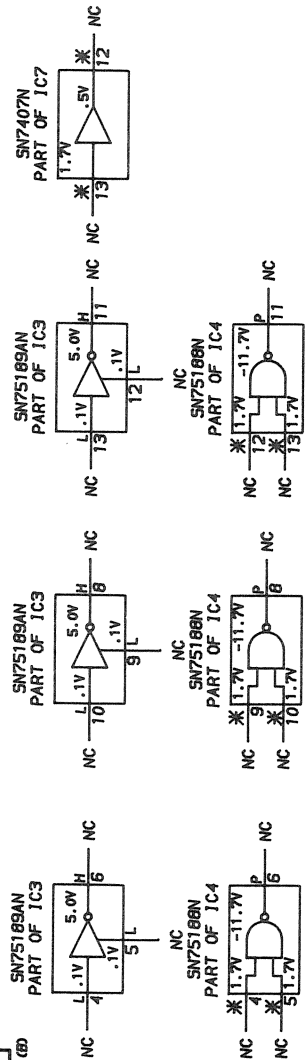
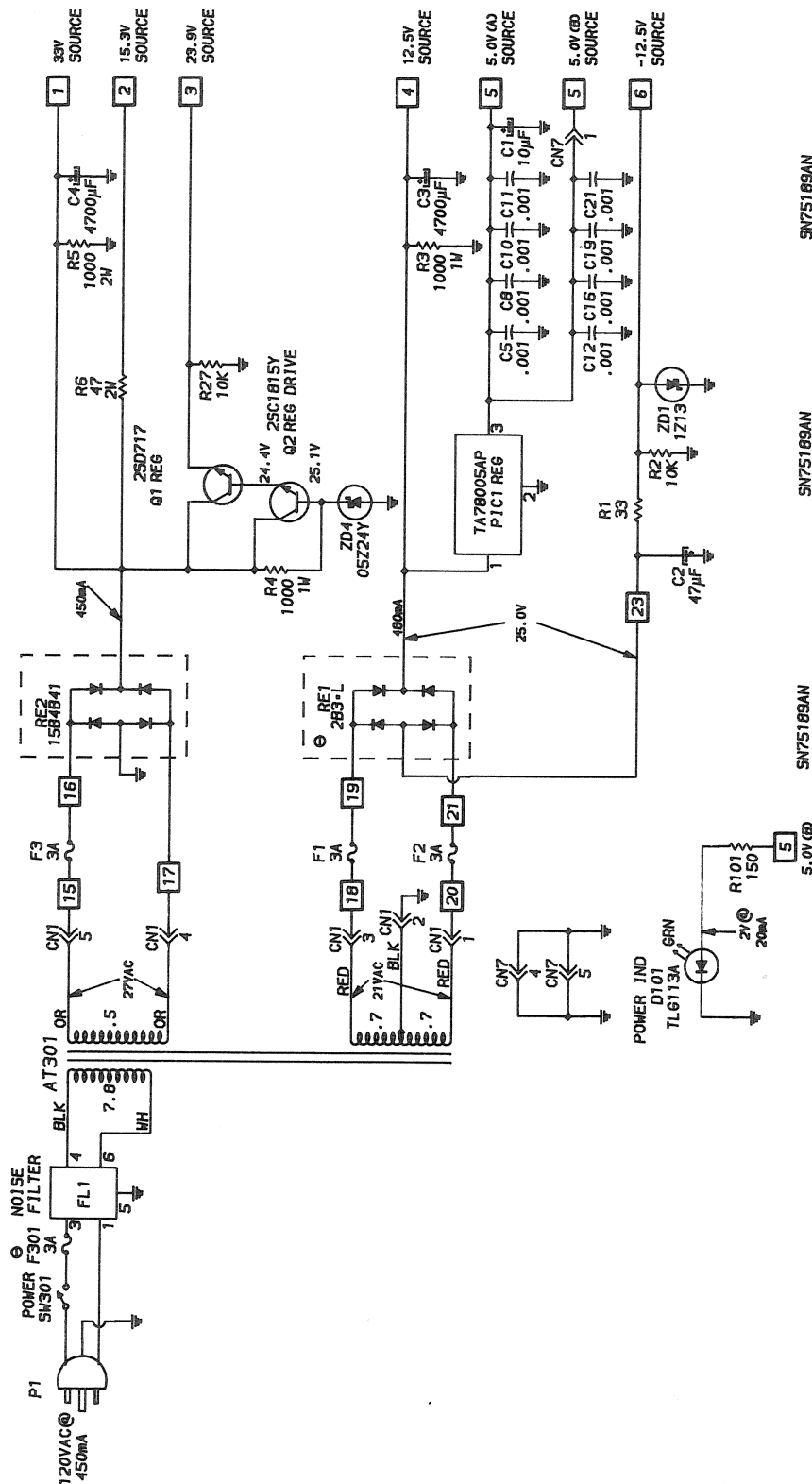


PHOTO CIRCUITTRACE = 11
SCHEMATIC CIRCUITTRACE = 11

FOR TERMINAL GUIDES AND NOTES
SEE PAGE 5,16

A PHOTOFAC STANDARD NOTATION SCHEMATIC

WITH CIRCUITTRACE

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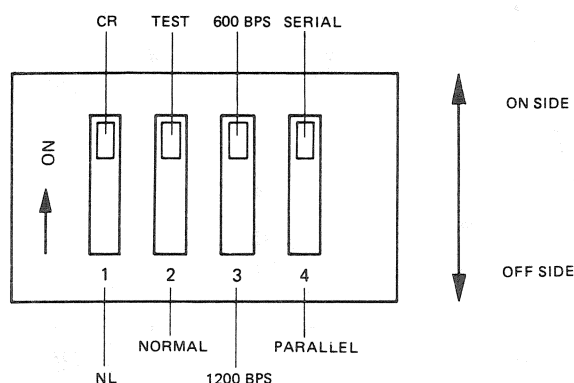
POWER SUPPLY

GENERAL OPERATING INSTRUCTIONS

SETTING DIP SWITCHES

There are four switches located at the rear of the Printer. Setting these switches allows the Printer to work with different host Computers.

NOTE: The Printer AC power must be Off before setting any of the switches.



PRINT FUNCTION (DIP) SWITCHES

SW NO.	SYMBOL	OFF	ON
1	NL/CR	Carriage return generates CR + LF (Line Feed) operation	Carriage return generates CR ONLY
2	NORMAL/TEST	Normal operation	Self-Test pattern
3	1200B/600B	1200 baud per second rate used serial interface	600 baud per second rate used serial interface
4	Parallel/Serial	Parallel Interface	Serial Interface

POWER UP

When the Printer is turned On, the RAM IC (IC13) is cleared by the CPU IC (IC11). The CPU IC then reads the function selection switch, drives the Carriage to the home position and waits to receive print data, Carriage, Line Feed and Lamp condition data. The print data sent from the Computer to the Printer is received by the CPU. After the printing start condition is fulfilled, the CPU moves the Carriage to print as the data directs. At completion the CPU stops the Carriage.

CARRIAGE MOVEMENT TEST

This test will check how freely the Carriage moves from one end of the Platen to the other and that the Platen advances properly. During this test there is no printing.

Place On-Line/Off-Line Switch (SW101) in On-Line position and turn Printer On. The Carriage will move right and left and execute a line feed at the end of each line. Turn Printer Off to stop Carriage Movement Test.

SELF-TEST

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PAPER EMPTY WARNING

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DISASSEMBLY INSTRUCTIONS

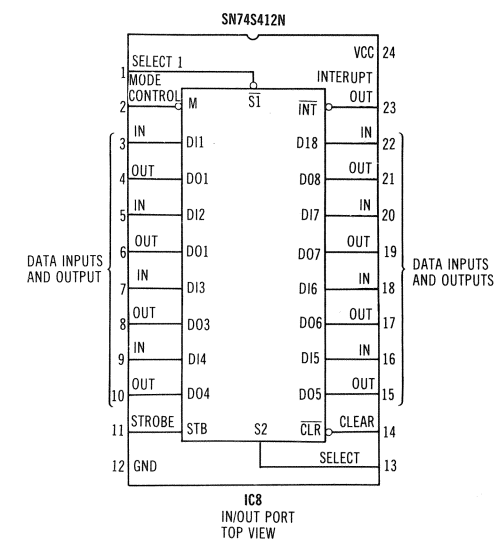
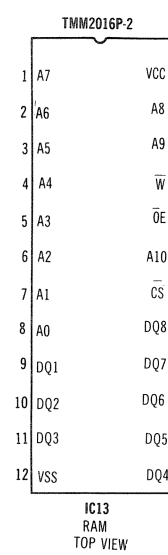
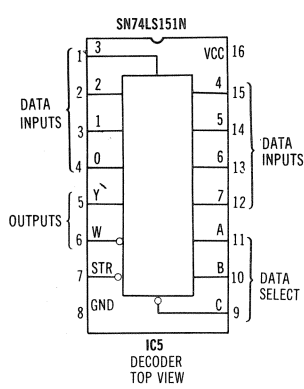
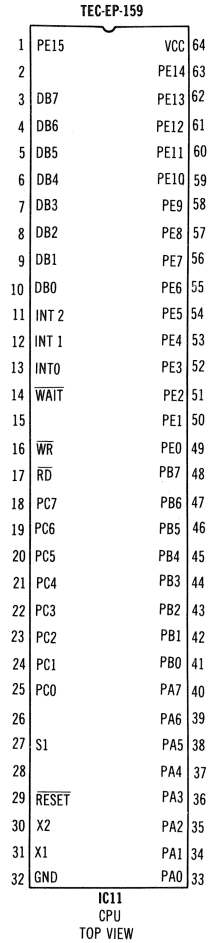
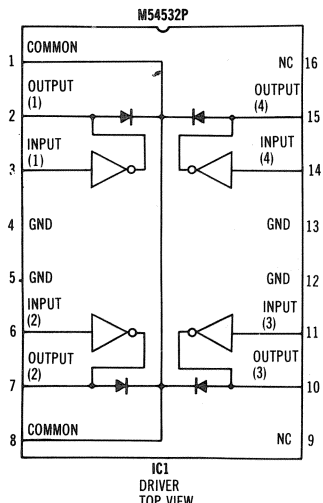
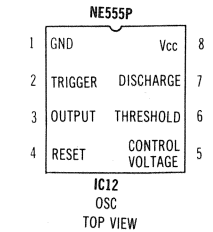
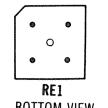
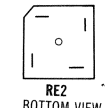
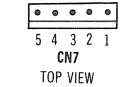
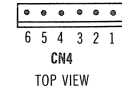
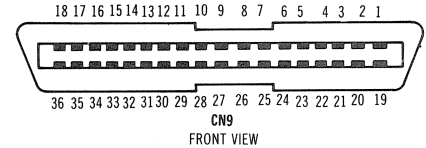
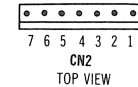
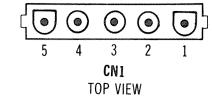
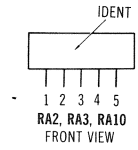
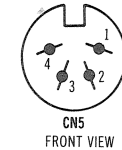
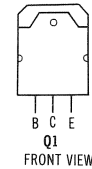
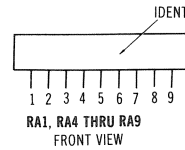
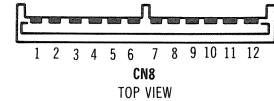
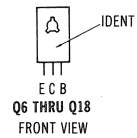
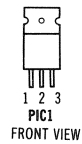
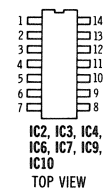
UPPER CABINET REMOVAL

Remove four screws (two each side) from cabinet bottom. Remove paper feed knob. Carefully lift cabinet top up and disconnect Connector CN7 and ground connector from Master Board. Remove cabinet top from Printer.

MASTER BOARD REMOVAL

Remove three screws from rear of Master board. Disconnect Print Head Connector (CN8). Carefully pull Master Board out from rear of Printer. Disconnect all connectors from Master Board to remove board from unit.

IC PINOUTS, TERMINAL GUIDES & SCHEMATIC NOTES



SCHEMATIC NOTES

- ✱ Circuitry not used in some versions
 - Circuitry used in some versions
 - ⊕ See parts list
 - ⊕ Ground
 - ▽ Common tie point
- Voltages measured with digital meter.
Waveforms and voltages are taken from ground, unless noted otherwise.
Voltages, waveforms and logic readings taken with printer On Line and not printing unless noted. Printer Self-Test mode used to get readings taken while printing.
Waveforms taken with triggered scope and Sweep/Time switch in Calibrate position, scope input set for DC coupling on "0" reference voltage waveforms. Switch to AC input to view waveforms after DC reference is measured when necessary. Each waveform is 7.5cm width with DC reference voltage given at the bottom line of each waveform. Time in μ s per cm, given with p-p reading at the end of each waveform.
Item numbers in rectangles appear in the alignment/adjustment instructions.
Supply voltage maintained as shown at input.

Controls adjusted for normal operation.
Terminal identification may not be found on unit.
Capacitors are 50V or less, 10% unless noted.
Electrolytics capacitors are 50V or less, 20%, unless noted.
Resistors are $\frac{1}{2}$ W or less, 5% unless noted.
Value in () used in some versions.
Measurements with switching as shown, unless noted.

NOTE: Logic probe readings taken with printer On Line and not printing unless otherwise noted. Printer Self-Test mode used to get readings while printing.

Logic Probe Display
L = Low
H = High
P = Pulse
* = Open (No light On)
(1) High during line feed.
(2) Low during line feed.
(3) Pulse during line feed.
(4) Logic readings not taken.



MASTER BOARD GridTrace LOCATION GUIDE

[illegible]

MECHANICAL REMOVAL, REPLACEMENT AND ADJUSTMENT

PRINT HEAD

The Print Head must always be positioned as close to the Platen as possible, without smudging paper, or the Print Head (M23) may be damaged in operation. If printing is light, move the Print Head Adjustment Lever toward the paper. If smudging occurs while printing, move the Print Head Adjustment Lever away from the paper one or two notches.

Check clearance between Print Head and Platen surface. This gap must be 0.014 to 0.016 inch (0.35 to 0.4mm) when the Print Head Adjustment Lever is set for nearest position to the Platen.

Adjust for proper clearance by holding the Gap Stud (M67) with a blade screwdriver as the nut for the stud is loosened with a nutdriver. Turn the blade screwdriver gradually to achieve correct gap clearance. Check the parallelism of Carriage Shaft to Platen. Re-tighten the stud retaining nuts. See Figure 1.

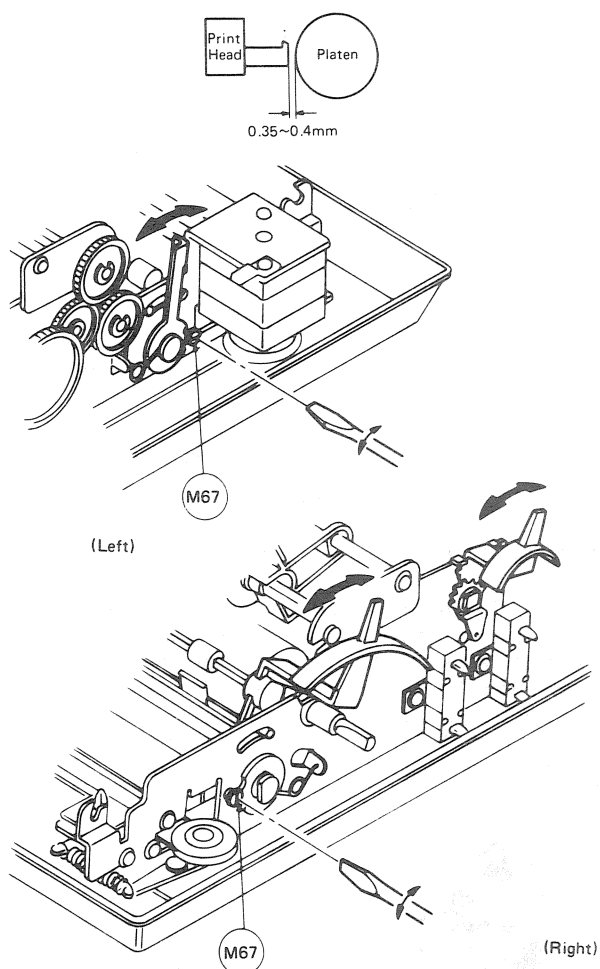


Figure 1

Removal of Print Head is accomplished by gently depressing the Print Head Support (M24) while rotating the open end toward the Platen and lifting it up and off of the left projection. Then, carefully lift up the Print Head (M23) and disconnect the flexible Printed Circuit Board (M25). See Figure 2.

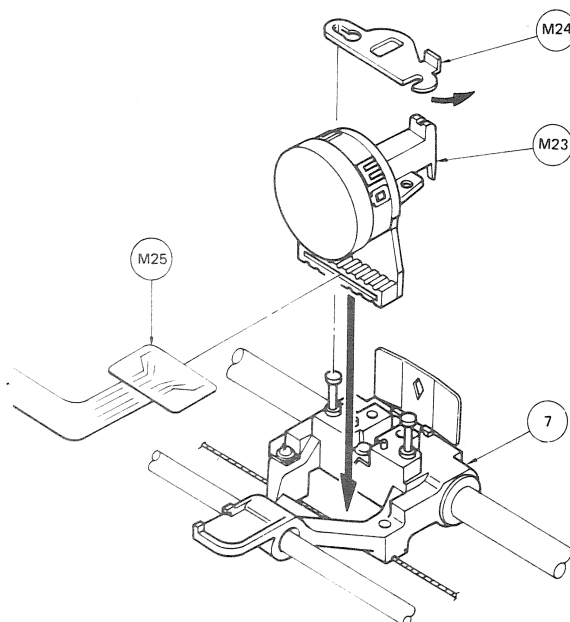


Figure 2

TRACTOR FEED ASSEMBLY

To install the Tractor Feed Assembly, turn Printer Off and remove top cover. While supporting the assembly, carefully place the claw slots on the lower front sides of the Tractor Feed Assembly onto the Printer studs near the ends of the Platen. See Figure 3.

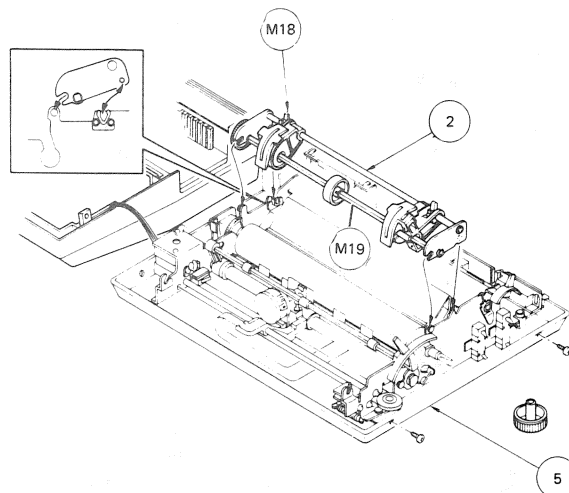


Figure 3

Tilt the assembly back and gently snap the rear assembly studs into place. Turn Paper Feed Knob to verify proper operation.

To remove Tractor Feed Assembly, lift up the rear part and disengage it from Printer.

Holes of the Left and Right Sprocket Wheels must be in line on the Paper Feed Shaft (M19). Each Tractor Cam (M18) is tilted backward to adjust the sprocket wheel position and tilted forward to fix the position.

MECHANICAL REMOVAL, REPLACEMENT AND ADJUSTMENT (Continued)

PLATEN REMOVAL

Remove Platen by rotating upward both tips of the Platen Support (M27) from the Side Frame projections and lifting the Platen Assembly (4) up and out of Printer. See Figure 4.

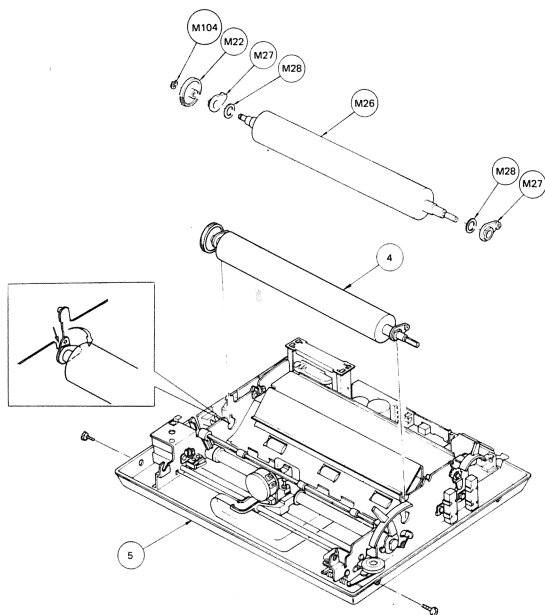


Figure 4

PAPER FEED MOTOR

Disconnect Paper Feed Motor Unit (M2) from Master Board. Remove two screws from outside of Left Side Frame (M29) holding motor to the inside of Left Side Frame and remove motor. See Figure 5.

When installing new Paper Feed Motor Unit, position it to achieve MINIMUM backlash between motor shaft gear and large idler gear.

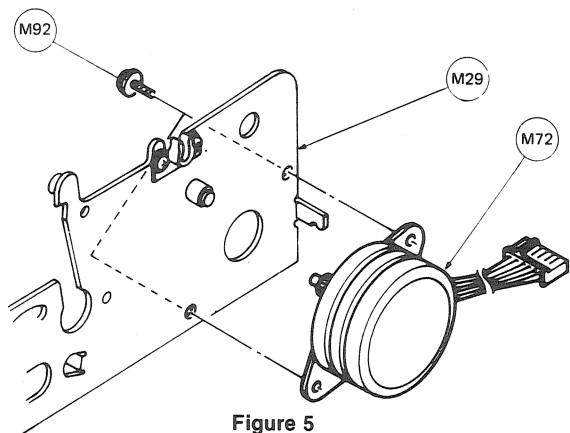


Figure 5

CARRIAGE MOTOR

Disconnect Carriage Motor Unit (M1) from Master Board. Disconnect the Long Carriage Wire (M64) from Print Head (M23). Pull out the two balls at the ends of the Carriage Wires (M64 and M112) wound on the Carriage Motor Unit pulley. Remove two screws holding motor to Left Side Frame (M29) and remove motor. See Figure 6.

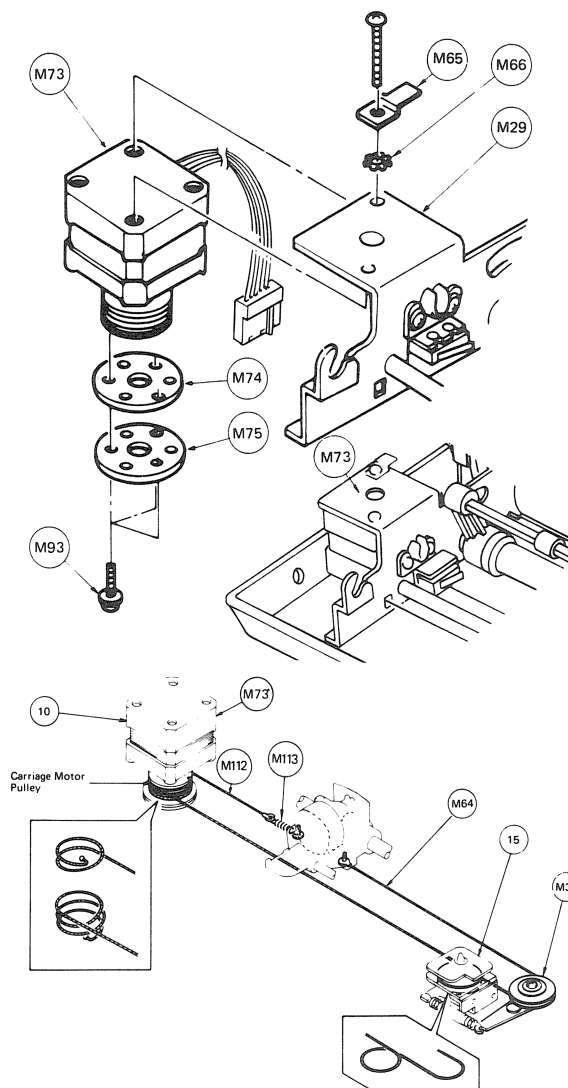


Figure 6

RIBBON CLUTCH

The Ribbon Clutch moves the Ribbon in one direction using the back and forth movement of the Carriage. Disconnect the Carriage Wire from the Carriage Motor Unit (M73) and remove it from the Ribbon Drive Pulley and Gear (M84). Remove Wire Tension Spring (M52). Remove two screws from outside of Right Side Frame (M30) holding Ribbon Clutch Assembly to the inside of Right Side Frame. See Figure 7.

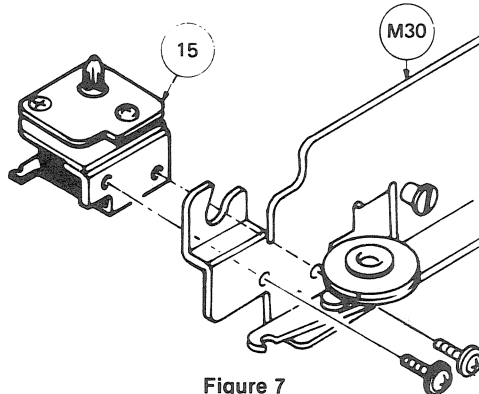


Figure 7

MECHANICAL REMOVAL, REPLACEMENT AND ADJUSTMENT (Continued)

RIBBON INSTALLATION/REMOVAL

When installing or replacing Ribbon Cassette make sure power to Printer is turned Off. Remove top cover and move Print Head Adjustment Lever all the way toward front of Printer. Carefully slide the Print Head to center of Platen. Hold Ribbon Cassette at the edges nearest the Platen and carefully lift it upward and out of Printer. (NOTE: When Printer power is turned Off information in Printer buffer is lost).

Tighten new Ribbon in Cassette before installing in Printer by turning the knob in the direction of the arrows. Gently place Cassette into the support brackets. DO NOT FORCE IT. See Figure 8.

Once Cassette is seated in brackets, and on Ribbon Clutch drive gear spindle, gently slide the Ribbon in between the guide and the Print Head. Re-tighten Ribbon using the Cassette knob.

Move Print Head left and right to check proper Ribbon advancement. Move Print Head Adjustment Lever to place Print Head as close to paper as possible until smudging occurs during the left to right moving of the Print Head. Then, back it away from the paper until the smudging stops.

Print Head must be as close as possible to paper or the Print Head may be damaged during operation.

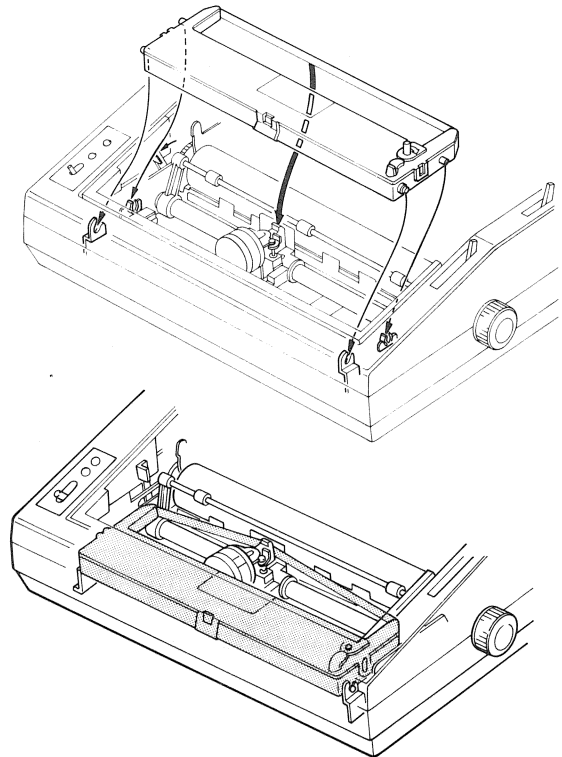


Figure 8

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CP6
RADIO SHACK
MODEL DMP-120

PARTS LIST AND DESCRIPTION

When ordering parts, state Model, Part Number, and Description

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA					
			GENERAL ELECTRIC PART No.	NEW-TONE NTE PART No.	PHILIPS ECG PART No.	RCA PART No.	WORKMAN PART No.	ZENITH PART No.
D1 Thru D13	S527B	2421TS527B	GE-504A	NTE116	ECG116	SK3311	WEP156	212-76-02
IC1	M54532P	2420M54532P		NTE834	ECG834	SK3569/834		221-121
IC2	LM339N	2420SLM339N		NTE75189	ECG75189	SK5189/75189		HE-443-795
IC3	SN75189AN	2420SN75189		NTE75188	ECG75188	SK5188/75188		HE-443-794
IC4	SN74LS18N	2420SN74LS18N		NTE74LS151	ECG74LS151	SK74LS151		
IC5	SN7407N	2420SN7407		NTE7407	ECG7407	SK7407		
IC6, 7	SN74S412N	2420SNS412N	8212	NTE8212	ECG8212			
IC8	SN7406N	2420SN7406	GE-7406	NTE7406	ECG7406	SK7406		HE-443-698
IC9								
IC10	SN7407N	2420SN7407		NTE7407	ECG7407	SK7407		
IC11	TEC EP-159	2420NTEP159		NTE955M	ECG955M	SK3564/955M	WEP2119/955M	221-Z9042
IC12	NE555P	2420SNNE555	GE IC-269	NTE955M				
IC13	TMM2016P-2	2420TMM16P2		NTE960	ECG960	SK3591/960		221-Z9043
PIC1	TA78005AP	2420T78005P	GEVR-102	NTE960				
Q1	2SD717	2422TD71700		NTE390	ECG390	SK3958/390	WEP66/199	121-Z9113
Q2	2SC1815Y	2422TC1815Y	GE-62	NTE85	ECG85	SK3124A/289A	WEP911/290A	121-Z9065
Q3	2SA1015GR	2422TA1015Y	GE-269	NTE290A	ECG290A	SK9132	WEP911/290A	121-Z9003*
Q4	2SA1015Y	2422TA1015Y	GE-269	NTE290A	ECG290A	SK9132	WEP66/199	121-Z9003*
Q5	2SC1815Y	2422TC1815Y	GE-62	NTE85	ECG85	SK3124A/289A		121-Z9065
Q6 Thru Q18	2SA1015GR	2422TA1015Y	GE-269	NTE290A	ECG290A	SK9132	WEP911/290A	121-Z9003*
	2SD1376	2422TD1376	GE-269	NTE290A	ECG290A	SK9370	WEP911/290A	121-Z9003*
	2SD1438	2422TD14380				SK9370		
RE1	2B3-L	2421T2B4B41		NTE5312	ECG5312	SK3985/5312	WEP1065	
RE2	2B4B41	2421T2B4B41		NTE5312	ECG5312	SK3985/5312	WEP1065	
ZD1	15B4B41	2421T15B4B41		NTE5312	ECG5312	SK3985/5312	WEP1065	
ZD2	1Z13	2421T1Z1300	GEZD-13	NTE143A	ECG143A	SK13V/143A	WEP1158/143	103-96
	1Z20	2421T1Z2000	GEZD-20	NTE5079A	ECG5079A	SK20V/5079A	WEP1153/5079	103-Z9023

PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA				
			GENERAL ELECTRIC PART No.	NEW-TONE NTE PART No.	PHILIPS ECG PART No.	RCA PART No.	WORKMAN PART No.
ZD3 ZD4 ZD5 Thru ZD7	05Z3.9X 05Z24Y 1Z15	2421T05Z39X 2421T05Z24Y 2421T1Z1500	GEZD-3.9 GEZD-24 GEZD-15	NTE5007A NTE5031A NTE145A	ECG5007A ECG5031A ECG145A	SK3A9/5007A SK24A/5031A SK15V/145A	WEPI407/5007 WEPI433/5031 WEPI114/145
							103-212 103-Z9013

* Lead configuration may vary from original.

WIRING DATA

Shielded Hook-up Wire	Use BELDEN No. 8401 or 8421 (Single-Conductor)
	8208 (Two-Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8529 (Solid) Available in 13 Colors
	8522 (Stranded) Available in 13 Colors

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		
		MFR. PART No.	NEW-TONE PART No.	WORKMAN PART No.
R1A R2A R7	51 5% 15W WW 51 5% 15W WW 12K 5% 1/4W 12K 1% 1/4W	HG82B012411 HG82B012411 2425B044122	QW312 QW275	22-1122
R15	7500 2% 1/4W	2425B043753	QW291	
R36	7500 1% 1/4W 9100 2% 1/4W 9100 1% 1/4W	2425B043753 2425B043914 24252881031		
RA1 RA2 RA3 RA4 RA5 RA6 RA7 RA8 RA9 RA10	Resistor Network (1) Resistor Network (2) Resistor Network (3) Resistor Network (4) Resistor Network (4) Resistor Network (5) Resistor Network (1) Resistor Network (1) Resistor Network (6) Resistor Network (2)	24252881031 24252841031 24252841021 24252881021 24252881021 24252882221 24252881031 24252881031 24252881021 24252841031		

- (1) Contains eight (8 ea.) 10K 10%.
 (2) Contains four (4 ea.) 10K 10%.
 (3) Contains four (4 ea.) 1000 10%.
 (4) Contains eight (8 ea.) 1000 10%.
 (5) Contains eight (8 ea.) 2200 5%.
 (6) Contains eight (8 ea.) 3300 10%.

RADIO SHACK
MODEL DMP-120

PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

TRANSFORMER (Power)

ITEM No.	RATING			REPLACEMENT DATA		
	PRI.	SEC. 1	SEC. 2	MFR. PART No.	THORDARSON PART No.	NOTES
AT301	120V AC @ 450mA AC	21V AC CT @ 480mA DC	27V AC @ 450mA DC	HG82B025401		
	SEC. 3	SEC. 4	SEC. 5			

HG82B025404 (European Models)

HG82B025403 (Australian and United Kingdom Models)

NOTE: Australian and European Models use 220/240V AC, 50Hz, 33W Maximum, power source.

FUSE DEVICES

ITEM NO.	DESCRIPTION	MFR. PART NO.		NOTES
		DEVICE	HOLDER	
F1	3A @ 125V AC Fast-Acting	24247000008	24246000004 (1)	
F2	3A @ 125V AC Fast-Acting	24247000008	24246000004 (1)	
F3	3A @ 125V AC Fast-Acting	24247000008	24246000004 (1)	
F301	3A @ 250V Fast-Acting	2424000069 (2)	24420060008 (2)	
	3.15A	24244000109 (3)	24246000110 (3)	

(1) 2 each used.

(2) Used in US and Canadian models.

(3) Used in Europe, Australia and United Kingdom models.

MISCELLANEOUS

ITEM No.	PART NAME	MFR. PART No.	NOTES
D101	LED	24440400124	Power, Green, 2V @ 20mA
D102	LED	24440400106	Alert, Red, 1.9V @ 6mA
FL1	Filter	24242000024	Noise
	Filter	242420000119	Noise (Australia, Europe, United Kingdom)
LC1	Filter	24245000014	
M1	Motor (M73)	HG82B013501	Carriage
M2	Motor (M72)	HG82B014001	Paper Feed
M23	Print Head	HG82C001201	
P1	Cord	HG82B018301	AC Power
	Cord	HG82B018303	AC Power, (Europe, United Kingdom)
	Cord	HG82B018304	AC Power, (Australia)
SW1	Switch, DIP	24453011101	Print Function
SW101	Switch	24450100232	On/Off Line
SW205	Switch	HG82B012721	Paper Empty
SW210	Switch	HG82B012501	Home Position
SW301	Switch	24450100124	AC Power
	Switch	24451960004	AC Power, (Australia, Europe, United Kingdom)
X1	Crystal	24240100005	4.00MHz Oscillator
	P.C. Board	HG82D000431	Master
	P.C. Board	HG82C012810	Control Panel

PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

CABINET & CABINET PARTS (When ordering specify model, chassis & color)

ITEM	PART No.
Cover, Printer	HG82C012601
Cover, Top	HG82C014101
Cover, Paper Guide	HG82B032501
Knob, Feed	HG06C000401
Paper Guide, Rear	HG06B005020
Separator	HG82B024201

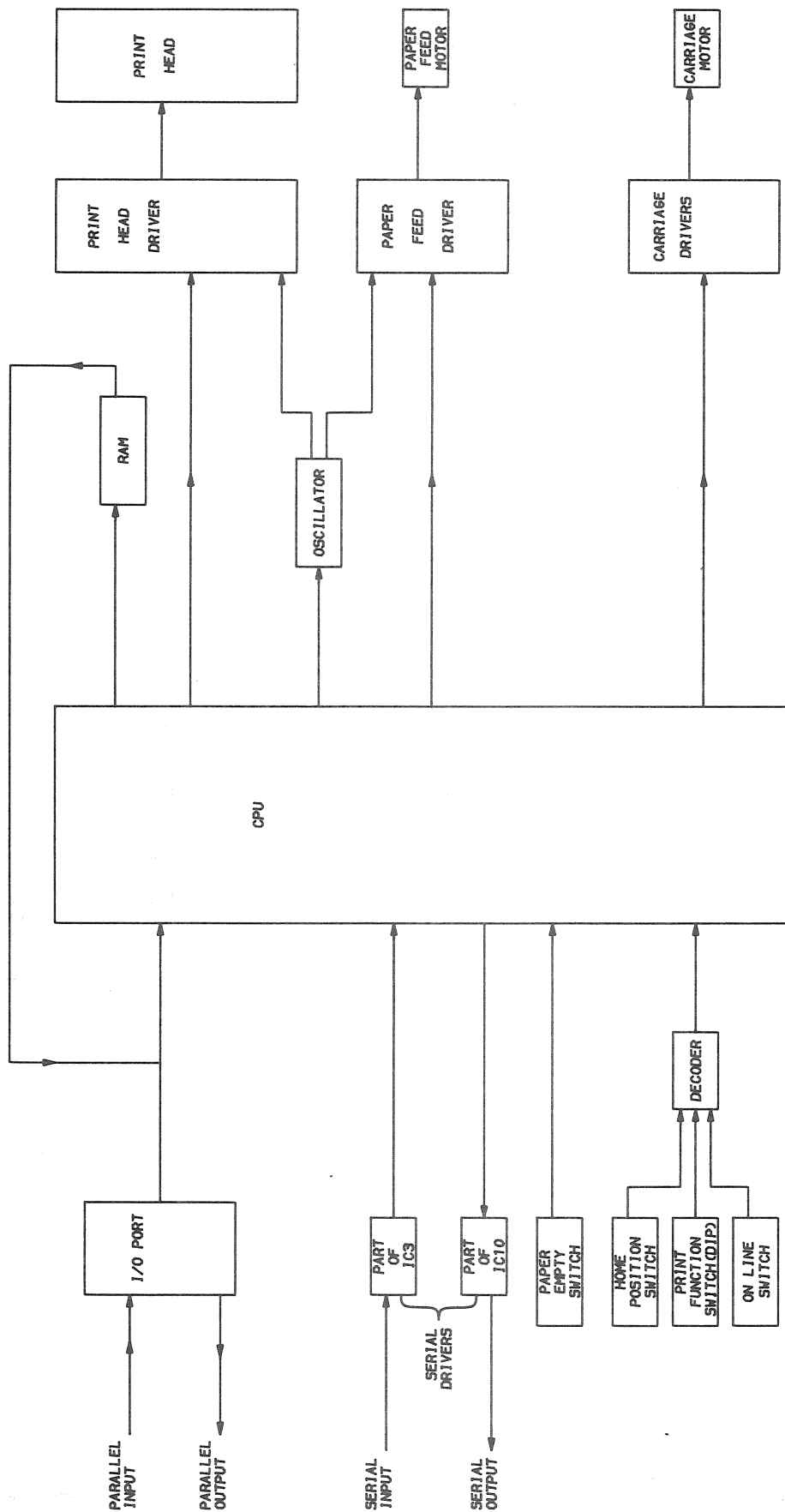
ITEM	PART No.
Paper Guide, Front	HG06B008010
Wire Basket	HG82B024101
Holder, Paper Roll	HG08C000900
Paper Roll Shaft	HG06C002300
Base, Printer	HG04E000020
Cover, Control Panel	HG06B009500

MECHANICAL PARTS LIST

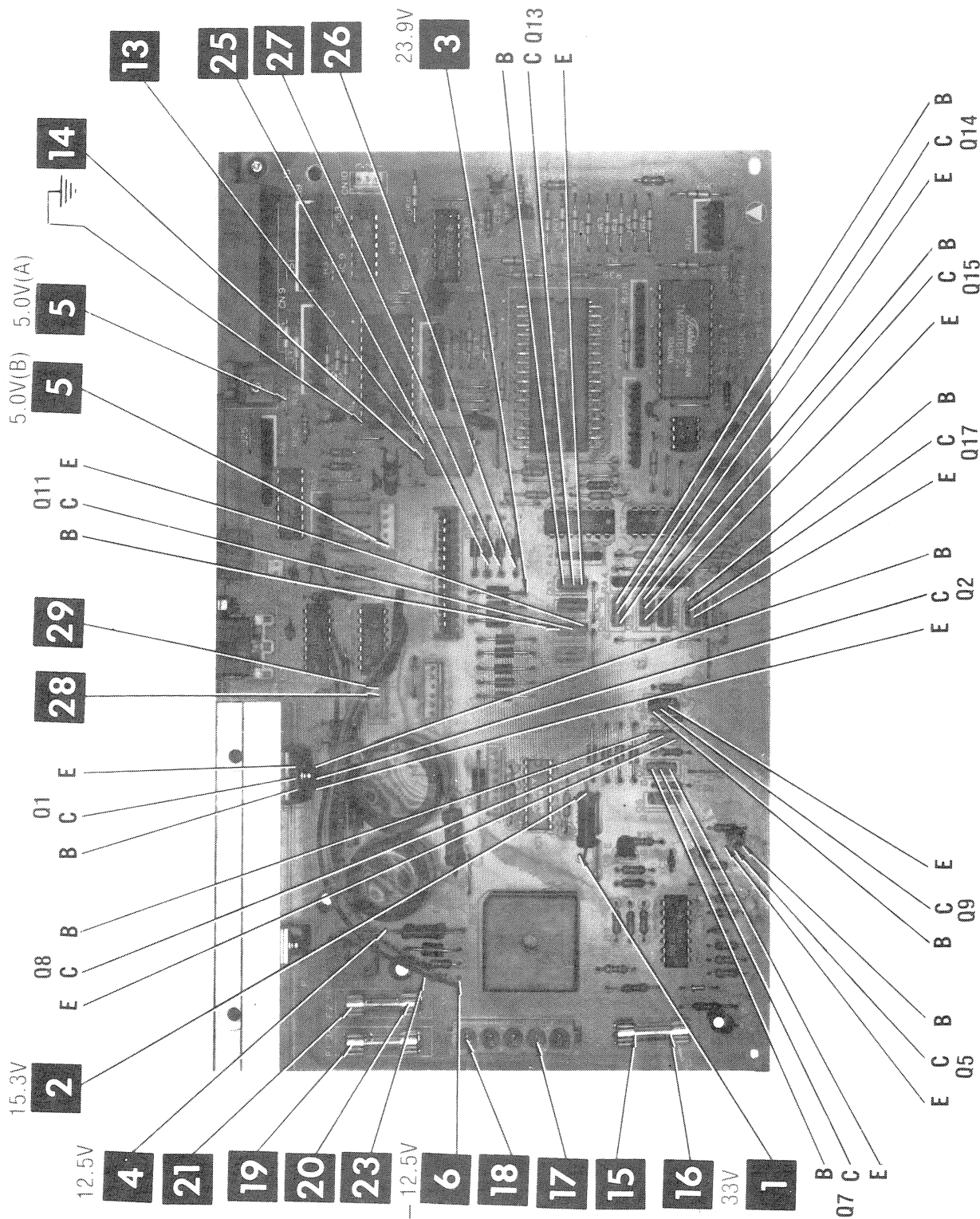
REF. NO.	PART NO.	DESCRIPTION
M13	HG06C002300	Shaft, Paper Roll
M14	HG82B015301	Tractor Frame, Right
M15	HG82B015401	Tractor Frame, Left
M16	HG82B019301	Tractor, Right
M17	HG82B019401	Tractor, Left
M18	HG06B005300	Tractor Cam
M19	HG03B006710	Shaft, Paper Feed
M20	HG03B006820	Shaft, Tractor
M21	HG06B008800	Ring, Paper Guide
M22	HG06B005400	Platen Gear
M23	HG82C001201	Unit Print Head (PH-290K)
M24	HG04B011600	Print Head Support
M25	HG11E001230	Flexible PCB
M26	HG02C000300	Platen
M27	HE06B015210	Platen Support
M28	HE04B146500	Platen Spacer
M29	HG82C007401	Side Frame, Left
M30	HG82C007501	Side Frame, Right
M31	HG06B005500	Idler Gear, Small
M32	HG06B005600	Idler Gear, Large
M33	HG04B011200	Release Cam
M34	HG82B013601	Release Lever
M35	HG03B007000	Release Shaft
M36	HG06B000900	Wire Pulley
M37	24741690402	Spacer (4x2)
M38	HG03B007100	Carriage Shaft, Rear
M39	HG03B007200	Carriage Shaft, Front
M40	HG06B005820	Paper Ball Arm, Right
M41	HG06B005920	Paper Ball Arm, Left
M42	HG03B008900	Shaft, Paper Ball
M43	HG06B007410	Roller, Paper Ball
M44	HG04B011400	Gap Cam, Right
M45	HG04B011310	Gap Cam, Left
M46	HG05B001700	Gap Spring, Right
M47	HG05B001600	Gap Spring, Left
M48	HE05B006620	Spring, Release Lever
M49	HG05B001810	Spring, Paper Ball
M50	HG06B020500	Catch, Tractor Frame
M51	HG04B011900	Nut Plate
M52	24051150282	Spring, Wire Tension
M53	24051150286	Spring, Paper Pan Hook
M54	HG04D000720	Paper Pan
M55	HG04C00471A	Paper Guide
M56	HG02B000800	Roller, Paper Feed

REF. NO.	PART NO.	DESCRIPTION
M57	HG04C004800	Paper Pressure
M58	HG04B018900	Support, Paper Pressure
M59	24051150009	Spring, Paper Pan
M61	HG06B003200	Foot, Printer
M62	HG03B010410	Foot, Screw (Ground)
M63	24089157060	PCB Holder
M64	HG08B00530B	Carriage Wire (Long)
M65	24420240336	Ground Plate
M67	HG03B010020	Gap Stud
M68	HG06D001430	Carriage
M69	HG04B020000	Ribbon Guide
M70	HG04B013410	Plate, Carriage Ground
M71	HG04C00451A	Base, Power Supply (US, US-1)
	HG04C00451B	Base, Power Supply (CA, EU, UK, AU, EU-1)
M72	HG82B014001	Unit, Paper Feed Motor (M2) (SP-55B-24)
M73	HG82B013501	Unit, Carriage Motor (M1) (2697-9012)
	HG82B013502	Unit, Carriage Motor (M1) (SPH-42F-12)
M74	HG04B018300	Damper (Up)
M75	HG04B018400	Damper (Down)
M82	HG09B003400	Cover, Switch
M83	HG82B014301	Base, Ribbon Clutch
M84	HG06B006400	Pulley, Ribbon Drive
M85	HG06B009600	Clutch Slider
M86	HG82B014401	Ribbon Gear Support
M87	HG06B006100	Ribbon Gear
M88	HG82B014501	Ribbon Clutch (Non Repairable Subassembly)
M89	HG06B006300	Gear, Ribbon Drive
M90	HG04B015800	Cover, Ribbon Clutch
M91	HG04B017410	Plate, Power Supply Protection (CA, AU)
M107	HG82B026801	Ribbon Cassette 26-1483 (US, JA, EU, UK, AU, US-1, EU-1)
	HG82B026802	Ribbon Cassette 26-1483 (CA)
M108	HG10B002700	Ribbon Cassette Box
M109	HG08B005100	Ink Ribbon
M112	HG08B00530A	Carriage, Wire (Short)
M113	HG05B003801	Spring, Carriage

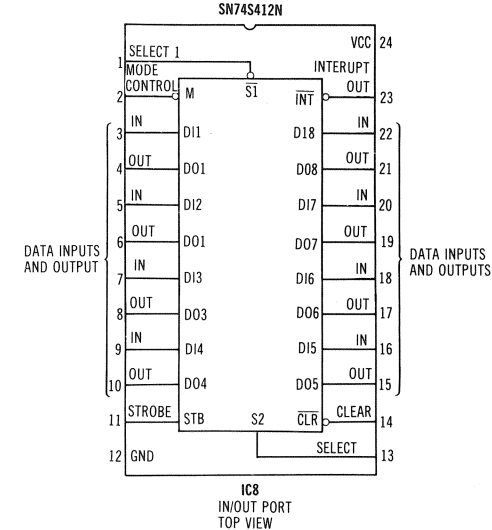
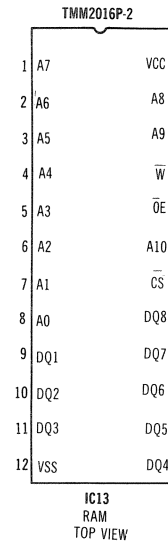
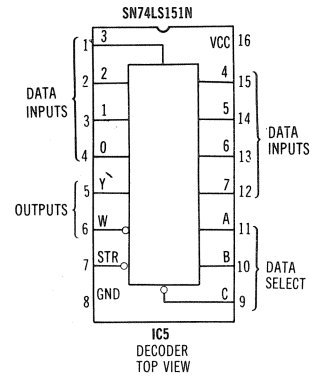
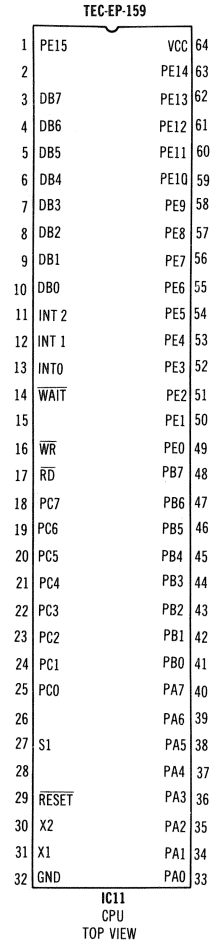
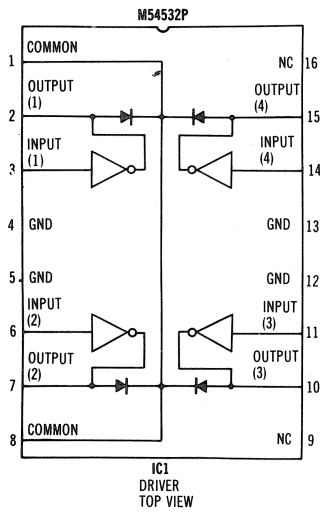
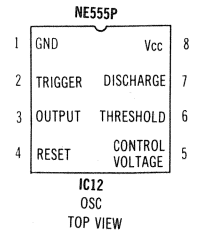
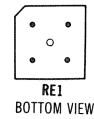
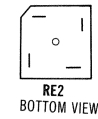
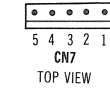
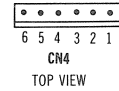
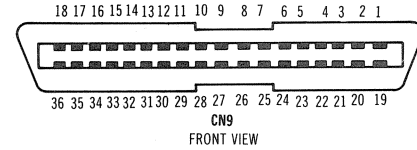
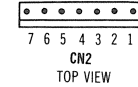
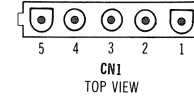
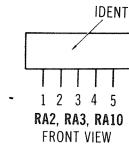
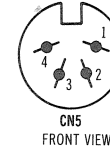
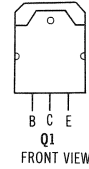
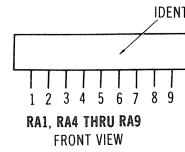
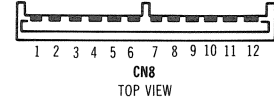
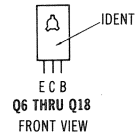
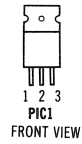
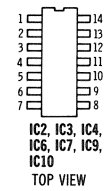
RADIO SHACK
MODEL DMP-120



BLOCK DIAGRAM



IC PINOUTS, TERMINAL GUIDES & SCHEMATIC NOTES



SCHEMATIC NOTES

- ✱ Circuitry not used in some versions
- Circuitry used in some versions
- ⊕ See parts list
- ⊕ Ground
- ▽ Common tie point

Voltages measured with digital meter.

Waveforms and voltages are taken from ground, unless noted otherwise.

Voltages, waveforms and logic readings taken with printer On Line and not printing unless noted. Printer Self-Test mode used to get readings taken while printing.

Waveforms taken with triggered scope and Sweep/Time switch in Calibrate position, scope input set for DC coupling on "0" reference voltage waveforms. Switch to AC input to view waveforms after DC reference is measured when necessary. Each waveform is 7.5cm width with DC reference voltage given at the bottom line of each waveform. Time in μ s per cm, given with p-p reading at the end of each waveform.

Item numbers in rectangles appear in the alignment/adjustment instructions.

Supply voltage maintained as shown at input.

Controls adjusted for normal operation.

Terminal identification may not be found on unit.

Capacitors are 50V or less, 10% unless noted.

Electrolytics capacitors are 50V or less, 20%, unless noted.

Resistors are $\frac{1}{2}$ W or less, 5% unless noted.

Value in () used in some versions.

Measurements with switching as shown, unless noted.

NOTE: Logic probe readings taken with printer On Line and not printing unless otherwise noted. Printer Self-Test mode used to get readings while printing.

Logic Probe Display

L = Low

H = High

P = Pulse

* = Open (No light On)

(1) High during line feed.

(2) Low during line feed.

(3) Pulse during line feed.

(4) Logic readings not taken.

LOGIC CHART

PIN NO.	IC1	IC2	IC3	IC4	IC5	IC6	IC7	PIN NO.	IC8	PIN NO.	IC8	PIN NO.	IC9	IC10
1	H(1)	H	L	P	H	P	P	1	P	13	L	1	H	H
2	H(1)	L	L	H	H	L	L	2	L	14	H	2	L	H
3	L(1)	H	H	P	H	P	P	3	H	15	P	3	L	L
4	L	H	L	*	H	L	L	4	P	16	H	4	H	L
5	L	H	L	*	H	P	P	5	H	17	P	5	H	L
6	L(1)	H	H	P	L	L	L	6	P	18	H	6	L	L
7	H(2)	H	L	L	L	L	L	7	H	19	P	7	L	L
8	H(3)	H	H	P	L	L	L	8	P	20	H	8	H	L
9	P	H	L	*	L	P	P	9	H	21	P	9	L	L
10	H(2)	H	L	*	L	L	L	10	P	22	H	10	L	H
11	L(1)	H	H	P	L	P	L	11	L	23	H	11	L	H
12	L	L	L	*	L	H	*	12	L	24	H	12	L	H
13	L	P	L	*	H	H	*					13	H	H
14	L(1)	L	H	H	H	H	H					14	H	H
15	H(2)				L									
16	P				H									
PIN NO.	IC11	PIN NO.	IC11	PIN NO.	IC11	PIN NO.	IC11	PIN NO.	IC12	PIN NO.	IC13	PIN NO.	IC13	PIC 1
1	L	17	P	33	P	49	P	1	L	1	P	13	P	(4)
2	P	18	H	34	P	50	P	2	P	2	P	14	P	
3	P	19	H	35	P	51	P	3	P	3	P	15	P	
4	P	20	H	36	P	52	P	4	H	4	P	16	P	
5	P	21	P	37	P	53	P	5	H	5	P	17	P	
6	P	22	L	38	P	54	P	6	P	6	P	18	L	
7	P	23	H	39	P	55	P	7	P	7	P	19	P	
8	P	24	L	40	P	56	P	8	H	8	P	20	P	
9	P	25	L	41	P	57	P			9	P	21	P	
10	P	26	P	42	P	58	P			10	P	22	P	
11	H	27	L	43	P	59	P			11	P	23	P	
12	L	28	L	44	P	60	P			12	L	24	H	
13	L	29	H	45	L(1)	61	H							
14	H	30	P	46	L(1)	62	L							
15	L	31	P	47	L(1)	63	L							
16	P	32	L	48	L(1)	64	H							

Logic Probe Display

L = Low

H = High

P = Pulse

* = Open (No light On)

(1) High during line feed.

(2) Low during line feed.

(3) Pulse during line feed.

(4) Logic readings not taken.

LINE DEFINITIONS

D0-D7 Data Lines

DOT ENABLE No Definition

DOT PULSE

DS1 No Definition

DS2 No Definition

H9

INT1 and 2 Interrupt

PA0-PA7 No Definition

PB0-PB7 No Definition

PC7 No Definition

SYCL No Definition

Any Bar above any alphabetical or numerical combination indicates line active in a low (0) state.

RADIO SHACK
MODEL DMP-120

TROUBLESHOOTING

NO POWER

If the Printer does not turn "ON", see if Power indicator (D101) is lighted. If indicator D101 is not lit, check the AC cord and the AC Fuse (F301). If Fuse F301 is open, check Power Transformer (AT301), the Noise Filter (FL1) and associated circuitry. If Fuse F301 is good, check Power Switch (SW301). Check DC Fuses (F1, F2 and F3) and replace any that are open. Check Rectifiers RE1 and RE2 for shorts or open circuit.

Disconnect Connector CN1 from board. Connect power to the Printer and check for 21VAC between pins 1 and 3 of Connector CN1. Check for 27VAC between pins 4 and 5 of Connector CN1.

Disconnect Connectors CN2, CN3 and CN4 from the board and reconnect Connector CN1 to the board. Check for 25V between the cathode and the anode of Rectifier RE1. Check for 33V between the cathode and the anode of Rectifier RE2.

Connect the negative lead of the voltmeter to the anode of Rectifier RE2 (ground) and check for 5V at pin 3 of Regulator IC (PIC 1). Check for 12.5V at pin 1 of IC PIC1, check for -12.5V at the anode of Rectifier RE1 and check for 23.9V at the emitter of Regulator Transistor (Q1). If the 23.9V is missing, check Regulator Transistors (Q1 and Q2) and Zener Diode (ZD4). If 5V is missing at pin 3 of IC PIC1, check IC PIC1 by substitution.

CPU OPERATION

Check for 4.9V at pin 64 of CPU IC (IC11). If the 4.9V is missing, refer to the "Power Supply" section of this Troubleshooting guide. Also check the 5V supply at pin 3 of Regulator IC (PIC1) and check continuity between pins 1 and 3 of Filter LC1.

Verify that the clock oscillator is functioning by checking the waveforms on pins 30 and 31 of IC IC11. If the oscillator is not functioning, check Crystal (X1) and associated components by substitution.

If the clock pulse is present, check for a frequency of 4MHz at pin 30 with a frequency counter. If the frequency is proper, set the Print Function Switch (SW1) for Self-Test mode and check waveforms at pins 21, 33 thru 40 and pins 41 thru 44 of IC IC11.

PRINT HEAD

If the Print Head is moving back and forth but not printing, check Connector CN8 for good connection. Check for 23.9V at the emitter of Regulator Transistor (Q1) and if missing see "Power Supply" section of this Troubleshooting guide. Also with the Printer operating, check for .4V at collectors of Pin Drive Transistors (Q10 thru Q18). If the collector of any Pin Drive Transistor measures approximately 23.9V, check the Print Head winding associated with that collector for continuity. If the Print Head windings measure normal, check IC's IC6 and IC7. Also check the voltage and logic readings on pins 33 thru 40 of CPU IC (IC11).

If the Print Head is printing but not moving, check Connector CN4. Also check for 33V at the cathode of Rectifier RE2. Check voltages, waveforms and components associated with Output Transistors (Q6, Q7, Q8 and Q9). If the voltages and waveforms are normal, check Resistors R1A and R2A and Connector CN3. Check the Carriage Motor (M1) by measuring the winding resistances at Connector CN4.

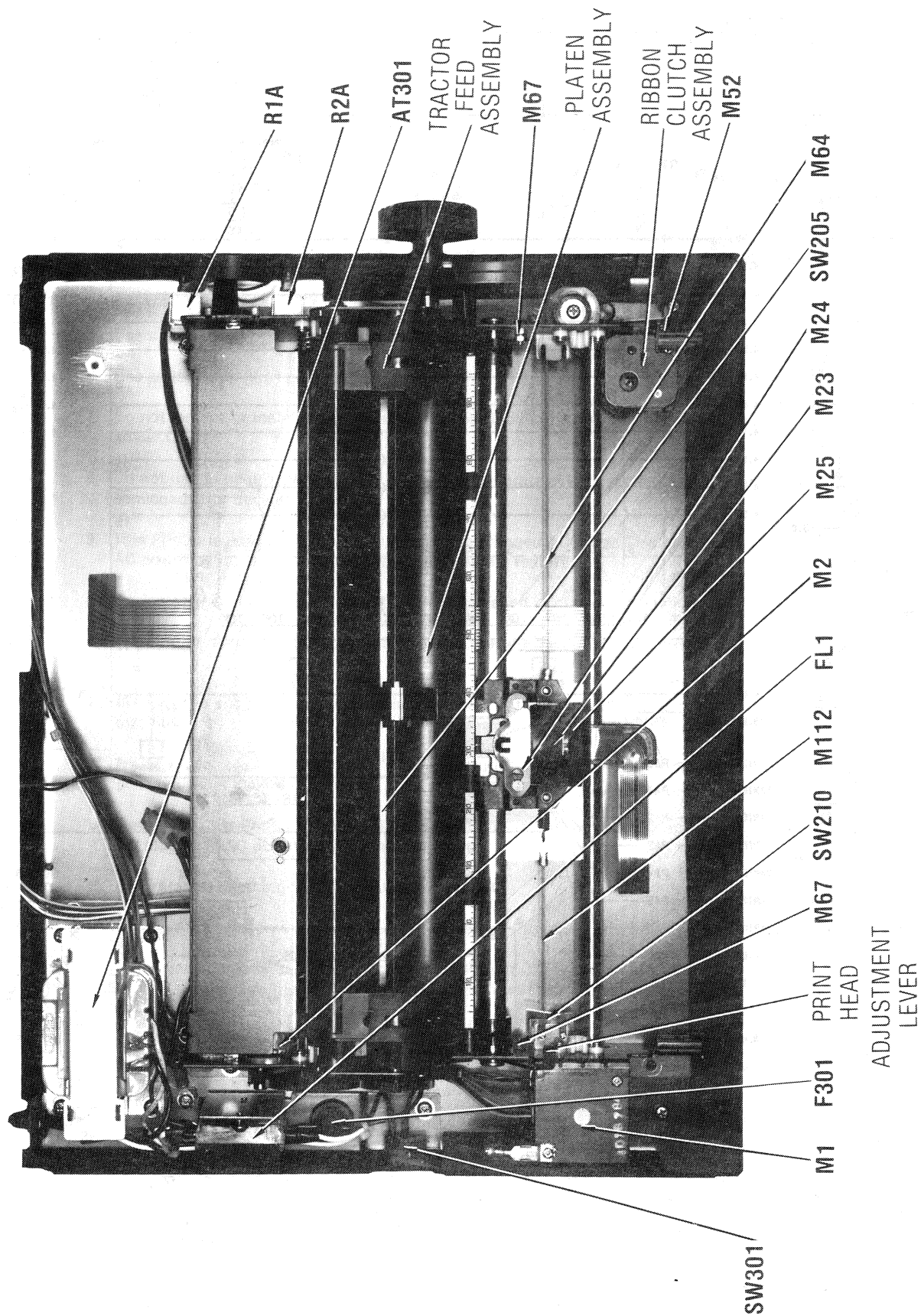
PAPER FEED MALFUNCTION

When Printer does not advance the paper, turn the Home Position Switch (SW201) to Off position and set the Print Function Switch (SW1) for Self-Test mode. Check the gear assembly on the left side of the Printer. Check the gear on the Paper Feed Motor (M2). It should not slip on the motor shaft. If motor M2 is not turning, check for waveforms at pins 2, 7, 10 and 15 of Driver IC (IC1). If the waveforms are missing, check the Master Board by substitution. If the waveforms are present, check the Connector CN2 and check Paper Feed Motor (M2) by substitution.

SAFETY PRECAUTIONS

1. Use an isolation transformer for servicing.
2. Maintain AC line voltage at rated input.
3. Remove AC power from the Printer before servicing or installing electrostatically sensitive devices. Examples of typical ES devices are integrated circuits and semiconductor "chip" components.
4. Use extreme caution when handling the printed circuit boards. Some semiconductor devices can be damaged easily by static electricity. Drain off any electrostatic charge on your body by touching a known earth ground. Wear a commercially available discharging wrist strap device. This should be removed prior to applying power to the unit under test.
5. Use a grounded-tip, low voltage soldering iron.
6. Use an isolation (times 10) probe on scope.
7. Do not remove or install boards, mechanical or electrical parts, or other peripherals with Printer AC power On.
8. Do not use freon-propelled sprays. These can generate electrical charges sufficient to damage semiconductor devices.
9. This Printer is equipped with a grounded three-pronged AC plug. This plug must fit into a grounded AC power outlet. Do not defeat the AC plug safety feature.
10. Periodically examine the AC power cord for damaged or cracked insulation.
11. The Printer cabinet is equipped with vents to prevent heat build-up. Never block, cover, or obstruct these vents.
12. Instructions should be given, especially to children, that objects should not be dropped or pushed into the vents of the cabinet. This could cause shock or equipment damage.
13. Never expose the Printer to water. If exposed turn the unit Off. Do not place the Printer near possible water sources.
14. Never leave the Printer unattended or plugged into the AC outlet for long periods of time. Remove AC plug from AC outlet during lightning storms.
15. Do not allow anything to rest on AC power cord.
16. Unplug AC power cord from outlet before cleaning Printer.
17. Never use liquids or aerosols directly on the Printer. Spray on cloth and then apply to the Printer cabinet. Make sure the Printer is disconnected from the AC power line.

CHASSIS-TOP VIEW



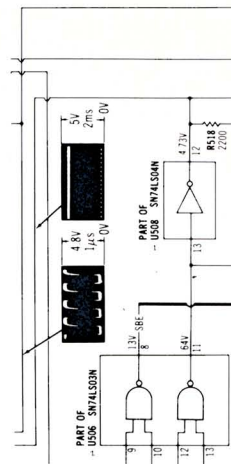
If seal is broken, nonreturnable.

SAWS

COMPUTERFACTS™ put easy to use, informative technical data right at your fingertips. Each edition includes specific service information on the individual component, along with some overall troubleshooting hints.

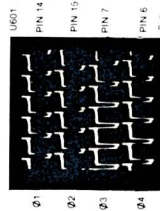
The following information is just a sample of the many valuable time saving features contained in this exclusive Sams COMPUTERFACTS publication:

- Preliminary Service Checks section is an easy to use, step by step guide for the experienced technician or hobbyist, and even beginners.
- SAMS famous industry accepted standardized notation schematics containing CIRCUIT TRACE[®], GRID TRACE[™], waveforms, voltages and stage identification.



- Step by Step Troubleshooting guides the technician through the necessary procedures to quickly locate the problem.

TROUBLESHOOTING



MICROPROCESSOR CHIP (CPU) OPERATION

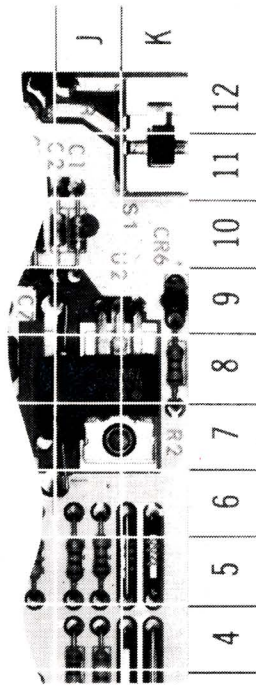
Verify the processor is functioning by checking the signals on the address lines using a logic probe or the data lines (lines 41 thru 56) using a logic probe or a scope. If a logic probe is used, refer to the "Logic Chart" for the correct readings. If a scope is used, the waveforms on the address lines (except pins 22 and 23) which have no signal in Power Up mode) should be similar to Figure 1. The waveforms on the data lines should be similar to Figure 2.

- Logic Chart containing logic probe readings to isolate defective circuitry and components.

LOGIC

PIN NO.	IC U100	PIN NO.	IC U100	PIN NO.	IC U102	IC U103	IC U104	IC U105	IC U106	IC U107	IC U108	IC U109
1	P	21	P	1	J	P	H	J	P	H	J	P
2	P	22	P	2	P	H	H	J	P	H	J	P
3	P	23	P	3	P	H	H	J	P	H	J	P

- Quick Component Location using the SAMS exclusive GRIDTRACE, CIRCUITTRACE, and component photographs.



- Complete Components Parts List in an easy to use format with field replacements shown when possible. SAMS unique semiconductor, chip and IC cross-reference gives you many replacements to choose from and is available at your Electronic Distributor.

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	TYPE No.	REPLACEMENT DATA							
		MFR PART No.	ECG PART No.	GENERAL ELECTRIC PART No.	MOTOROLA PART No.	NTE PART No.	RCA PART No.	WORKMAN PART No.	ZENITH PART No.
0102	15553	1149-25-76	EC0519	GE-514	1N4035	NTS519	5K9093/177	WE9028/519	103-131
0103	15005M	1149-25-27	EC0519	GE-504A	1N4035	NTS509	5K9093/177	WE9151/109	103-12001
0201	1N4034Q	1201-4205	EC0116	GE-504A	1N4004	NT116	SK3312	WE157	212-76-02
0501	15535	1149-25-76	EC0519	GE-514	1N4235	NTS519	5K9093/177	WE9225/519	103-131
0503	15535	1149-25-76	EC0519	GE-514	1N4235	NTS519	5K9093/177	WE9225/519	103-131

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